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# Corruption in the construction of public infrastructure: Critical issues in project preparation

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Anti-corruption in sectors series editor: Aránzazu Guillán Montero

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# Abstract

Corruption in the construction of public infrastructure has particularly serious implications for developing countries. Inappropriate project choice, high prices, poor quality, excessive time and cost overruns, inadequate maintenance, and low returns, among other challenges, impact negatively on economic growth and poverty alleviation. Corruption during the early stages of the project cycle, when projects are appraised, designed, and budgeted, may open up doors for additional corruption later on. Examples are presented to demonstrate how skewed incentives during project preparation can facilitate corruption during implementation (and create further negative impacts on project value). Efforts to improve transparency should focus on the procedures surrounding decision-making during project preparation. However, where corruption is deeply embedded, breaking the links among participants in the various stages of project delivery may be the only way to improving the governance of project preparation.

# About the author

Jill is a social scientist with a Ph.D. in development studies and more than 35 years of experience in development work. She has worked for International Organisations, Government, NGOs and the Private Sector. Until recently she was serving as Construction Specialist at the International Labour Office (ILO) in Geneva. She also has spent considerable periods in academia and has undertaken extensive research in Africa (Tanzania, Kenya) and Asia (Bangladesh, Vietnam, India).

# 1. Introduction

Roughly one half of all fixed capital investment by governments is in the construction of public infrastructure – an essential component of economic growth and social development. The key problem for developing countries is often seen as insufficient funding for construction of these much-needed infrastructure projects. Yet at the same time governments, citizens, and donors are frequently dissatisfied with the outcomes of these projects, which often involve the waste or misallocation of precious state resources. This paper focuses on public infrastructure in low income countries where major challenges include inappropriate project choice, high prices, poor quality, excessive time and cost overruns, inadequate maintenance, and low returns. These problems impact negatively on economic growth and poverty alleviation and have led to a search for ways to get better "value for money" from the construction industry.

Planning and delivering a construction project is a highly complex exercise and much of the explanation for poor performance must be attributed to weak capacity and poor management of the various processes involved. But corruption cannot be ignored, and recent years have seen a large number of studies examining the issue of corruption in the construction sector. There are many stages in the delivery of a construction project and corruption can occur at any stage (see figure 1). However, most attention to date (particularly from the World Bank and other multilateral development banks) has focused on the tender process and, even more narrowly, on tender for the award of contracts for construction (works).

**Figure 1. Major stages in the construction project cycle**

*Source: Author*

Payment of a bribe to win a construction contract is a clear indication of corruption and cannot easily be mistaken for mismanagement. Estimates of the percentage of construction costs lost to bribe payments vary globally from 5% to 20% or even higher. However, Kenny (2006, 2009a) argues that focusing solely on bribes paid during the tender process as an indicator of the costs of corruption may be misplaced. He notes that the financial and economic costs of bribes are not the same, and economic costs will vary according to what the bribe is paid for. Bribery – or other forms of corruption[1] – will have different impacts at different stages of the project cycle and in relation to different types of projects.[2] Using data from a large number of studies he suggests that the forms of corruption that are most harmful for development outcomes are (1) corruption that influences the project appraisal, design, and budgeting process by diverting investment towards projects with low returns and towards new construction at the expense of maintenance and (2) corruption during project implementation that results in substandard construction that shortens the life of projects and hence drastically reduces the economic rate of return (ERR).

[1] Other forms of corruption such as fraud, coercion, and collusion are defined in the annex to this paper.

[2] These issues are explored at length by Rose-Ackerman (1999).

This paper seeks to strengthen understanding of the processes that govern the selection and preparation of construction projects for public investment - the first two stages presented in figure 1. It also explores how additional opportunities for corruption arise and projects fail to meet their objectives when the initial selection and preparation process is compromised. The paper argues that the two most harmful forms of corruption identified by Kenny (2006, 2009a) are linked: skewed incentives that lead to the selection of poor projects at the project appraisal and budgeting stage can have a major impact on the subsequent stages of project implementation and, ultimately, on the value of the project.

The paper focuses on addressing institutional weaknesses and improving governance in order to deliver better development outcomes, as opposed to identifying specific "anti-corruption" measures, the effectiveness of which is little understood (Wells 2012, Kenny 2009b). Since corruption can thrive where governance is weak, strengthening governance processes at key points of the project cycle should also lessen the opportunities for corruption (Paterson and Chaudhuri 2007).

The paper is divided into three main sections. Section two outlines the essential features of an efficient public investment management (PIM) system, focusing on the key steps in project preparation (appraisal, selection, design and budgeting), many of which are missing in low income countries. This provides the framework for the discussion in the rest of the paper. Section three presents evidence of corruption risks and consequences at different stages of construction projects. Evidence is drawn from the literature as well as from the detailed project information disclosed during the pilot of the Construction Sector Transparency (CoST) initiative.[3] The concluding section highlights the importance of a political economy approach to understanding the probable limitations to adopting the apparently rational and much needed reforms that are likely to challenge vested interests.

# 2. Essential steps in project preparation

During the project preparation period, significant opportunities arise for the diversion of public resources to favour political or private interests. This stage of the project cycle is when some of the worst forms of grand corruption and state capture occur. But this is not all. Failures in project preparation (whether due to corruption, negligence, or capacity constraints) can also open up opportunities for corruption at later stages of the project cycle. For example, inadequate project preparation may lead to subsequent implementation delays that may require changes that can be manipulated to benefit individuals or companies. The preparation stage is especially likely to facilitate corrupt acts at a later stage when failures at this stage are deliberate.

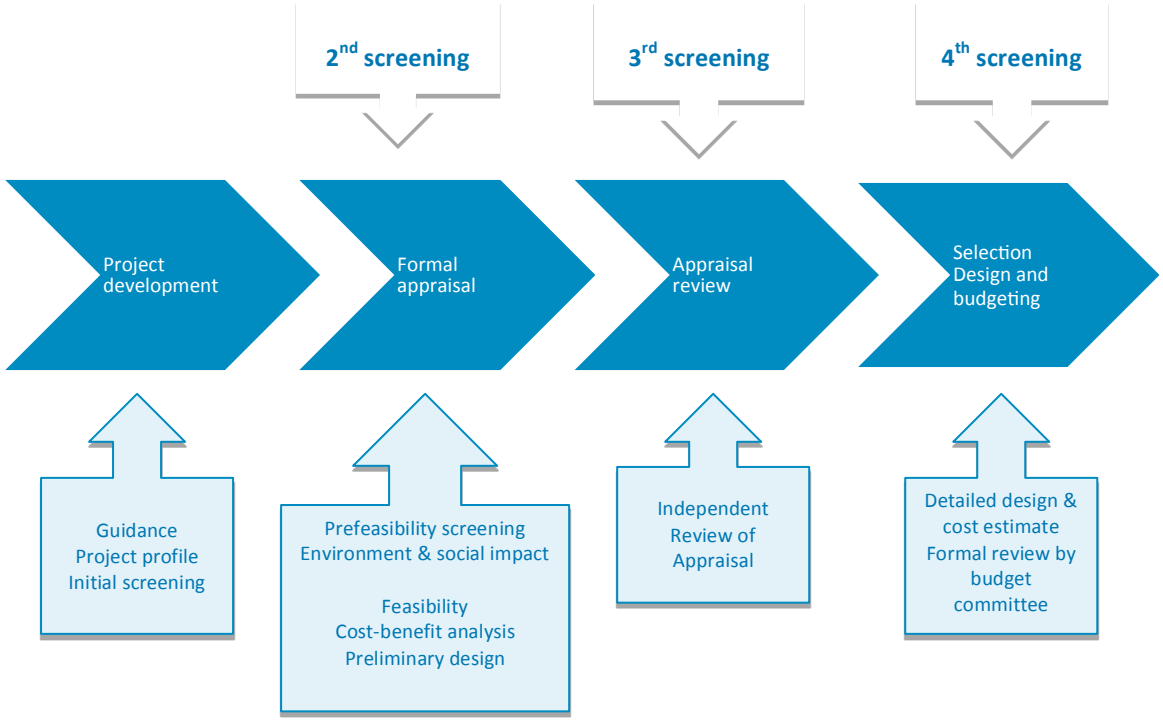
When properly executed, project preparation can take several years, often many more years than the actual construction. Research suggests that the care with which decisions are taken in these early stages can have the greatest impact on the success of a project (Hawkins, Herd, and Wells 2006).

Effective management of public investment in new construction projects has received considerable attention in a number of recent publications from the World Bank. Rajaram et al. (2010) highlighted eight "must have" features that are considered essential minimum requirements for an effective public investment management system. These key features cover all stages of a project from initial

[3] The CoST initiative was piloted in eight countries (Ethiopia, Guatemala, Malawi, Philippines, Tanzania, Vietnam, Zambia, and the UK) between 2008 and 2011. A new programme was launched in 2012. It is a voluntary initiative that requires public disclosure of key information about construction projects. Further details and publications can be found at www.constructiontransparency.org.

development through appraisal, implementation, operation, and maintenance to final evaluation. This section focuses on the first four features, which make up the "preparation phase" of construction projects. The details of the features and the key steps within them are illustrated in figure 2 and summarised below.[4]

**Figure 2. Four "must have" features for project preparation**




*Source: Adapted from Rajaram et.al. (2010)*

## 2.1 Project development and initial screening

The development of possible projects for investment should involve a number of steps. The first step is to provide guidance to ensure that the proposed project is consistent with the country's development objectives. Ideally these would be laid out in a national plan or other long term strategic document that sets development priorities at the highest level and is supplemented by sector or sub-sector level strategies that provide more detail for translating national priorities to the sector level (Dabla-Norris et al. 2011). The next step is for line ministries and spending agencies wishing to initiate a project to prepare a "project profile," which should include the problem to be addressed, its strategic priority, the project's objective, planned activities in fulfilment of the project, and an estimated budget. The profile should also include an assessment of options for addressing the problem in other ways (that is, without engaging in the proposed project).

[4] Those already familiar with the literature may choose to skip straight to section three, where the main messages are presented.

Project profiles should then go forward to a first level of screening to assess consistency with the government's strategic goals. This level of screening (along with all other screening levels) should be independent, so that unnecessary and inappropriate projects can be objectively eliminated at an early stage. This will avoid the waste of public resources on projects that may later be aborted.

## 2.2 Formal project appraisal

Projects passing the first screening test should be appraised for their economic feasibility at the prefeasibility stage. This is the second level of screening when projects that are unlikely to be economically viable are discarded and alternatives (such as maintaining or rehabilitating existing infrastructure) identified.

Projects passing the test should be subjected to a full feasibility analysis which should involve rigorous scrutiny of costs and benefits. The complex techniques of cost-benefit analysis are generally poorly developed in low income countries. The emphasis should therefore be on basic elements of formal project appraisal. According to Rajaram et al. (2010), the project appraisal should include the following:

- a solid justification for the project,
- clear objectives of the project,
- identification and examination of several alternative options to meet the objectives,
- a detailed analysis of the most promising option,
- a full and accurate estimation of project costs, and
- a qualitative and quantitative assessment of the benefits that justify the costs.

One problem here is that project costs cannot be accurately estimated in the absence of the detailed design and engineering specifications. Rajaram et al. (ibid.) suggest that a detailed design be undertaken only *after* a project is selected for funding and before budgeting. This is the most rational sequence, since paying for the design of projects that are subsequently never built is a major source of loss in many countries and can indicate corruption and rent-seeking by professional consultants (a form of white collar crime that is widely under-estimated). However, incurring some design costs is an inevitable part of the feasibility analysis. This places even greater emphasis on the need to screen out projects that are clear losers at the prefeasibility stage so as to avoid incurring unnecessary cost.

Environmental and social impact assessments would also be undertaken at this stage. Failure to address and resolve land and resettlement issues early may lead to later delays.

## 2.3 Independent appraisal review

The risk of undue influence will often be lower if project appraisals are subject to an independent review. This is the third level of screening and is usually undertaken by a centralised ministry of finance or planning. Independent review is necessary in order to detect the failure to consider alternatives and instances of over-design, as well as to counteract a tendency of line ministries and agencies to underestimate the cost and/or overestimate the benefits of the proposed project.

## 2.4 Project selection and budgeting

Once a project is selected, a detailed design must be prepared so that project costs can be accurately estimated and funds can be included in the budget. Ensuring an adequate budget for the project should prevent the situation arising where the client is unable to make prompt payment for work that has been done; this can be a major source of corruption (since contractors may then pay bribes to secure their payment). Since most construction projects extend over several years, multiyear forecasts of costs should be linked to annual budgets. The source of funds for operation and maintenance should also be identified at the planning stage, with both recurrent and investment expenditures integrated into the budget.

A formal review process through the budget committee (or equivalent in the legislature) may be needed to avoid the possibility of projects "jumping the fence" or side-stepping controls put in place to keep out poor quality projects (Dabla-Norris et al. 2011). This is the fourth level of screening**.**

## 2.5 Missing and poorly implemented features in low income countries

In many low income countries, the stages described above are either missing or poorly carried out. Rajaram et al. (2010) developed a diagnostic framework to assess country performance in each of the main stages of the public investment management cycle. This subsequently provided the basis for construction of an index of the efficiency of public investment management (Dabla-Norris et al. 2011).

The index records the quality and efficiency of the investment process across four stages: (1) ex ante project appraisal, (2) project selection and budgeting, (3) project implementation, and (4) ex-post evaluation and audit. These are the first two and the last two stages as set out in figure 1. A total of 71 low and middle income countries were scored on each of the four stages. The scoring involved making qualitative assessments on 17 individual components in each stage, with each component scored on a scale of 0 to 4 (with a higher score reflecting better performance). The various components were then combined to form a composite PIM index (ibid.).

Unsurprisingly, Dabla-Norris et.al. (2011) found that low income countries and oil exporting countries had the lowest overall scores. The overall median score was 1.68, but scores ranged from a low of 0.27 (Belize) to a high of 3.50 (South Africa). The highest scores were among middle income countries (South Africa, Brazil, Colombia, Tunisia, and Thailand). Across regions, eastern Europe and central Asian countries had relatively more developed PIM processes, followed by Latin America, East Asia, and the Pacific. The Middle East, North Africa, and sub-Saharan Africa regions trailed furthest behind (ibid.).

More interesting than variations across countries and regions was the considerable variation in individual scores for each of the four stages. Generally, the first and last stages (ex-ante appraisal and ex post evaluation) were the weakest. The median score for project appraisal was only 1.33, with country scores ranging from 4 for South Africa and Colombia down to 0 for a number of low income countries. These included several in sub-Saharan Africa (Guinea, Chad, Sierra Leone, the Republic of Congo, and Sao Tome and Principe), as well as Trinidad and Tobago, Belize, the West Bank and Gaza, and the Solomon Islands (ibid.).

The conclusion emerging from this exercise is that, while a number of countries have improved their project implementation (mainly through the introduction of procurement reforms), only a handful of developing countries have been able to improve the processes of project appraisal, design, and selection – hence moving towards better construction project management. Effective construction

project management – that is, good projects that are well-executed – is indicated by cell A in the table below.

**Table 1. Stylized typology of PIM-system performance**

| | | Project implementation | |
|---|---|---|---|
| | | Well executed | Poorly executed |
| Project design and selection | Good projects | A | C |
| | Poor projects | B | D |

*Source: Rajaram et al. (2010)*

The weakness of project appraisal in low income countries (as identified by Dabla-Norris et al.'s study) must in large part be attributed to weak capacity on the part of public sector construction clients. One possible solution would be to outsource appraisals to private consulting companies, although government officials overseeing contracts with private companies would still need to have a good understanding of appraisal techniques in order to properly supervise the work. Outsourcing to private companies would also create new corruption risks. However, capacity is not the only problem. The failure to undertake a serious ex ante appraisal – or ignoring the results of appraisals that are undertaken – may be a deliberate government action that flags corruption.

The next section outlines the main corruption risks during the project preparation phase of construction projects and discusses the potential consequences when critical steps are inadequately carried out or bypassed altogether. Proper implementation of PIM features should address many of the risks.

Rajaram et.al. (2010) identified four "must have" features during project preparation. These were as shown in figure 2. For purposes of this paper, we are adapting them slightly: in section 3, we will merge project appraisal with appraisal review, and we will also separate detailed design from budgeting. The four stages to be analysed in the next section will be (1) Project development and initial screening, (2) Formal appraisal and independent review, (3) Project selection and detailed design, and (4) Budgeting.

# 3. Corruption risks and consequences of failures in project preparation

The aim of the PIM features outlined above is to ensure that good projects are selected for inclusion in government investment programmes. Missing or badly implemented features can occur because of negligence, mismanagement, or a simple lack of capacity. But weakness in project preparation can also be deliberate and indicate corrupt intent. Regardless of the reasons for ineffective PIM at the preliminary stages of a project, it can have repercussions beyond an inappropriate choice of projects, leading to corrupt acts during project implementation.

This section focuses in turn on each of the four major features in project preparation that were discussed above, slightly adapting them to emphasize the importance of detailed project design. Under each heading the main corrupt acts that the PIM feature is expected to address will first be outlined. This is followed by an explanation of potential consequences if the steps are bypassed or badly carried out (whether or not the failure is due to corruption) and the opportunities this could create for corruption at later stages of the project cycle. A summary of the corruption risks and consequences at each of the four stages is presented in table 2.

## 3.1 Project development and initial screening

Politicians and public officials can use large capital projects to obtain personal gain or win votes, instead of selecting projects on the basis of compliance with national- and sector-level strategic plans.

The objective of the initial screening processes is to eliminate projects that fail early tests of need and feasibility so that resources are not wasted on planning and development.

### 3.1.1 Corruption risks addressed by initial screening

The major corruption risks at the initial project development stage include the following:

- The use of power by politicians or public officials to promote projects for the personal gain of themselves and/or their supporters.
- The government's promotion of specific projects in return for contributions to party funds.
- Bribery or lobbying by the private sector to propose projects for illegitimate private gain.

Construction projects can be promoted as a source of incomes for the personal enrichment of decision-makers and their political supporters. One example comes from Uganda where Booth and Golooba-Mutebi (2009, 5) concluded, "All of the evidence indicates that, under the pre-2008 arrangements, the roads divisions of the Ministry of Works operated as a well-oiled machine for generating corrupt earnings from kickbacks." They went on to show how this operated as a complex system of political patronage. In addition to ensuring the personal enrichment of the minister, chief engineer, and many senior civil servants, the arrangement also provided a reliable means of accumulating funds to be made available to state house and other top government offices for "political" uses (such as patronage and campaign finance). Public officials raised money through a variety of means including accepting bribes for awarding contracts and signing completion certificates. The relative difficulty of skimming resources from donor-funded projects led to a situation where only a fraction of project funds made available by donors was being utilised.

Using road construction projects for gaining political support is evident in many other countries. In Kenya, Burgess et al. (2009) found strong evidence that road expansion in any given year is closely related to the home regions of the prime minister and the minister for public works, as well as to those of other ethnic groups represented in the cabinet. One outcome of this phenomenon is deterioration of the road network in areas that lack a high ranking minister or political connections (Wales and Wild 2012).

Table 2. Key corruption risks at key steps of project preparation

| | Project development and initial screening | Formal appraisal and independent review | Project selection and detailed design | Budgeting |
|---|---|---|---|---|
| **Corrupt acts the PIM feature can address** | • Political influence to promote projects for the personal gain of decision-makers or their supporters<br>• Promotion of projects in return for contributions to party funds<br>• Bribery or lobbying by private consultants and/or contractors to propose projects for private gain | • Deliberate underestimation of costs and the inflation of benefits to get uneconomic projects approved<br>• Political influence to favour large projects and new construction over maintenance | • Over-design to increase fees and profits<br>• Design to favour one contractor<br>• Incomplete designs that leave room for changes that can later be manipulated<br>• High cost estimates to provide a cushion for later diversion of funds | • Political influence to "hijack" the budget process, that is, getting projects designed for private or political gain into the budget without proper appraisal ("jumping the fence")<br>• Implementation of projects that have not been included in the budget |
| **Consequences of bypassing steps** | • "White elephant" projects with little or no social benefit<br>• Loss of investment through incomplete or aborted projects | • Neglect of maintenance<br>• Projects with low economic returns<br>• Excessive cost overruns | • Above average unit costs<br>• Incomplete design that prevents an accurate estimate of costs (which can lead to acceptance of tender prices below actual costs) | • Inadequate funds in capital budgets for appraised projects<br>• Budget constraints leading to late payment by the client |
| **Links to further corrupt acts at later stages** | • Extraction of bribes for lucrative design contracts for projects that are never built | • Extraction of bribes for the award of lucrative design and/or construction contracts.<br>• Collusion to siphon funds during project implementation | • Incomplete design and/or unrealistically low tender prices that create opportunities for cheating during implementation as well as collusion to siphon funds | • Late payments that weaken the moral authority of clients, allow opportunistic behaviour and create a major reason why contract conditions are not enforced |

In the period leading up to elections, politicians often interfere to push projects that benefit their constituents (generally roads and bridges). Governments can also use construction projects as a major source of election funding for the ruling party. They can do this by expanding the number of contracts put out to tender in an election year (and extracting bribes in connection with those contracts) or by approving specific projects in return for contributions to party funds. Pleasing constituents by promising projects, while possibly at the same time raising party funds, appears to have occurred in Tanzania. In the year prior to the 2010 election, the national roads agency (TANROADS) signed 22 major road projects. The projects were to be completed in three years but only 6.5% of the total

project cost was included in the 2010/2011 budget (TANROADS 2011). At the time of this paper, none of the projects has been completed and most have been cancelled.

Private companies also may use illegitimate means (such as bribery) to promote projects for private gain. This can happen in a number of different contexts. For example, it can occur where bilateral funding is available for construction and projects are prioritised by the construction companies themselves. This has been common with Chinese-funded projects in Cambodia (Sato et al. 2010) as well as in Angola, where the Chinese Ministry of Foreign and Commercial Affairs (MOFCOM) has in the past put forward its own suggestions for investment (Campos and Vines 2008). However, it is most evident in the context of privately financed construction, particularly in public private partnerships (PPP) for the construction and/or ownership and operation of infrastructure facilities. One well-known example is when Enron's Dabhol Power Corporation (DBC) signed a deal for power provision in India that produced power at a price seven times higher than other electricity providers. This occurred despite warnings from the World Bank that the project was too expensive. It was later alleged that local politicians had been paid off with bribes (Kenny and Søreide 2008).

### 3.1.2 Consequences of missed early screening

The most serious and obvious consequence of inadequate early screening is the inclusion in investment plans of "white elephant" projects with high costs and grossly negative rates of return (see box A). Such projects should be screened out at or before the prefeasibility stage. Even if they are aborted at a later stage before full implementation, these projects may still give rise to lucrative consulting contracts in the preparation stage (e.g., appraisal and planning) and in the detailed design stage, which will result in an inefficient use of resources.

When such projects do continue to the construction stage, further corruption may occur in the tender process, especially if loopholes ensure that favoured companies win the bid. This is likely to continue during project implementation, when consultants appointed to supervise construction collude with contractors to facilitate skimming funds from the project. With inadequate funds left to do the work to the required specifications, the quality and life expectancy of the constructed asset will be seriously affected. These risks can occur in any project, but are more likely in projects conceived purely as vehicles for corruption. Early screening can reduce the number of such projects.

**Box A: White elephant projects**

The World Bank has identified three types of white elephant projects (World Bank 2013):

- Excess capacity infrastructure, such as a road or airport with little or no traffic demand;
- Projects for which there is no operational budget to provide services that will be needed for success (such as hospitals or schools); and
- Capital investment in projects that are never completed (sometimes not even started) but are used to secure access to the contract value.

An example of the first type can be found in Angola, where close examination of the list of projects in 2011 revealed a bridge to be built in a remote area of the country's southeast region to which there were no connecting roads – quite literally, this was a "bridge to nowhere." This project could not have been approved with even a cursory evaluation (Wells 2011).

The second type (also in Angola) is illustrated by the expansion of power generation capacity that was not matched by investment in transmission and distribution, so that the power could get to the users (Pushak and Foster 2011).

The third type has been well-illustrated by the award of a contract for major road projects in Uganda. Part of the contract value was siphoned off and used for patronage payments, and many of the projects were never completed (Booth and Golooba-Mutebi 2009).

The repercussions of the failure to screen out projects designed for political patronage and/or personal enrichment can be illustrated in the context of the roads sector in Uganda. One result of corruption in that sector was that construction firms got into the habit of factoring various dimensions of Uganda's "poor business climate" into their cost calculations: "These have typically included the need to enjoy a good relationship with a well-placed political 'godfather', to 'grease palms' at all levels and to anticipate late or erratic payments for work done" (Booth and Golooba-Mutebi 2009, 6). This created a tendency to inflate costs, with the result that the kilometre price of road construction in Uganda was double that of similar roads in Zambia. A further consequence was that in spite of the very high price the country paid, it received sub-standard roads, since the skimming of funds from the projects meant firms had to accept being paid less than they would have been paid to do the job properly: "In consequence, they have been in the position of undertaking or (as consulting engineers) endorsing works done below the agreed specification or left uncompleted as resources have run out" (ibid.).

## 3.2 Project appraisal and independent review

Project appraisal involves a detailed analysis of costs and benefits of a proposed project in order to assess its economic feasibility. Subjecting project appraisals to independent review should enable detection of inaccurate estimates of project costs and benefits, ensure that alternatives are given adequate consideration and avoid subjectivity on the part of decision-makers.

### 3.2.1 Corruption risks addressed by appraisal and review

The major risks of corruption at the project feasibility stage include the following:

- Deliberate overestimation of project benefits and underestimation of project costs in order to get projects approved.
- Political influence to favour large projects over small projects and maintenance schemes.

There are a variety of motives for deliberate underestimation of costs in order to get projects approved which have low economic returns. In a review of 258 mega transport projects worldwide, Flyvjberg (2007) found costs seriously underestimated at the time of the decision to build.[5] He argued that this could not be solely due to a lack of experience or to the existence of "optimism bias" among planners and promoters, but in many cases deception is deliberate and can be traced to political and organisation pressures, agency problems, and distorted incentives (see also Flyvjberg, Garbuio, and Lovallo 2009). In a later study, Flyvbjerg and Molloy (2011) concluded that when seemingly rational forecasts that underestimate costs and overestimate benefits become the norm, forecasting becomes "another kind of rent-seeking behaviour, resulting in a make believe world of misrepresentation that makes project prioritisation an opaque and almost arbitrary process" (ibid., 100).

Where the estimation of costs and benefits is outsourced to private consulting firms (which is often the case), not only may consultants be under pressure from their clients to emphasise the benefits and underestimate the costs of a project so that it is approved, but also they may have personal economic incentives to do so. For example, they could seek repeat business (since consultants appointed for feasibility studies often go on to do the detailed design) or other opportunities to benefit from collusion with contractors during the implementation stage.

A key objective of project appraisal is to identify alternative ways of meeting the perceived need, including considering maintenance or rehabilitation schemes instead of new construction. But politicians often prefer to construct new roads and other infrastructure rather than to rehabilitate or maintain existing structures. Bribes to win contracts are often tied to project costs, so there is a strong incentive to promote large, new projects over small projects such as maintenance and rehabilitation. Large projects offer the chance of higher corrupt earnings, as well as greater opportunities for political patronage.

Inadequate expenditure on maintenance is well-documented. On the basis of World Bank estimates of maintenance costs of various types of infrastructure, Kenny (2007) argued that operation and maintenance budgets in many developing countries are too low to sustain existing stocks. One estimate for Latin America suggested that maintenance expenditures were approximately half of the level they should be (Rioja 2003). While there are many reasons for low spending on maintenance, Tanzi and Davoodi (1997) used cross country data and regression analysis to show an association with higher corruption levels.

### 3.2.2 Consequences of missing or poor appraisals

When appraisals are not conducted, are poorly conducted, or involve a deliberate distortion of expected costs and benefits, the result is the approval of poor quality projects with low economic and social returns. For some years, the poor end value of construction projects in many low income

[5] Underestimation of costs averaged 45% in rail, 35% in bridges and tunnels, and 20% in roads. The average level of under-estimation for the 10 developing country projects included in the sample was 64.6%.

countries has concerned economists at the World Bank and the International Monetary Fund (IMF). Brumby and Kaiser (2012, 110) point out that "in many developing countries deep concerns remain about the inefficiency of public investment projects, the ability of administrations to create value-for-money assets, and the lack of champions to push an agenda to improve public investment management (PIM)." They note that some estimates suggest that a typical unit of spending in developing countries translates into only half a unit of value of corresponding physical capital assets. Low quality public infrastructure is due to many factors but Tanzi and Davoodi (1997, 1) show an association with higher levels of corruption, concluding that "corruption, particularly political or 'grand corruption', distorts the entire decision-making process connected with public investment projects."

The underestimation of costs at the project appraisal phase in order to get poor projects into the budget is also likely to result in the acceptance of unrealistically low tenders for construction contracts. This can create opportunities for corruption at later stages of the project cycle. The award of a contract at a price that is too low to cover the actual costs of construction can land the winning contractor in serious trouble, which is why it is often referred to as the "winners curse" (Wells 2014). A contractor in this position will seek ways to cover potential losses by putting in exaggerated claims for reimbursement, which leads to significant cost increases during project implementation. The more unscrupulous will also cheat on materials, compromise on quality, and deliver below the specification, which results in poor quality assets and high maintenance costs (ibid.). The economic effect of the low quality outcomes of such projects are magnified by the fact that maintenance costs are unlikely to be included in future budget allocations.

Both submitting inflated claims and engaging in poor performance require collaboration between the contractor and the supervising engineer. Often administrators and officials in the agency handling the procurement are complicit in these acts. Where the original low cost estimate was a deliberate deception, representatives of the client (politicians or senior civil servants) are also likely to be involved.

## 3.3 Project selection and detailed design

Once a project is selected for inclusion in the budget a detailed design must be completed so the construction costs can be accurately assessed. An accurate cost estimate is needed for budgeting, but also so that when the construction contract is put out to tender, unrealistic bids (either too high or too low) can be rejected during bid evaluation. As Messick (2011, 26) has pointed out, "Critical to evaluating bids are reliable, independent and current estimates of the projected cost of the project."

### 3.3.1 Corruption risks in the detailed design stage

The major risks of corruption during project design are as follows:

- Over-design to increase consultants' fees.
- High cost estimates to provide a cushion for later diversion of funds.
- Incomplete design to leave room for changes that can later be manipulated.

A particular form of corruption at the detailed design stage is "over-design," that is, increasing the project size or specifications in order to increase consultants' fees and contractors' profits. Many different types of consultants may be involved in project preparation (e.g., architects, engineers, quantity surveyors, and cost estimators). The practice of paying them on the basis of a percentage of the total cost of the project (which is still common in many countries) creates a perverse incentive for

designers to raise the specification and inflate the price – and hence their fees. Even where such financial incentives are not present, the consultant responsible for design is in a powerful position. She or he may be pressured to design a project to favour a specific contractor's technology, and contractors (or clients) may bribe the consultant to bring this about (Stansbury 2005).

Consultants are also responsible for estimating project costs prior to tender. In doing so, they can inflate estimates to provide a cushion for the subsequent diversion of funds. During the CoST pilot phase, concerns were expressed regarding overinflated cost estimates in a number of projects. For example, in a project in Ethiopia the engineer's estimated project cost was almost 400% of the cost that had been estimated during the appraisal phase four years earlier, and this could not be attributed to inflation (CoST 2011a). In Vietnam, the estimated cost of a road increased in the 18 months between the first and second approval, even though the size of the project was reduced from a six- to a four-lane road (ibid.).

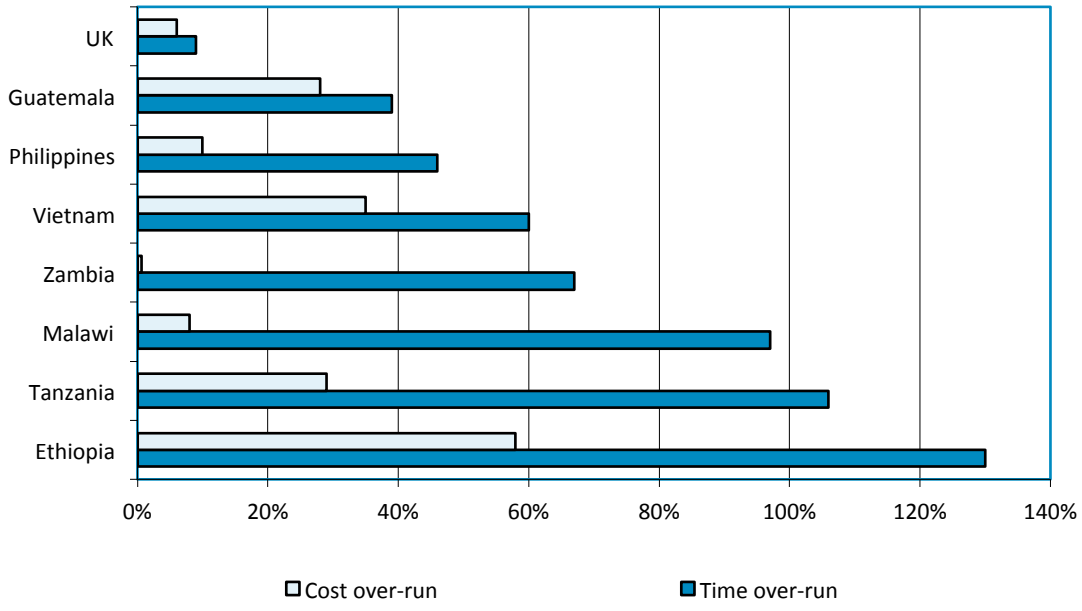
A less obvious, although potentially more serious, form of corruption at the design stage is failure to complete the design to the detail required for estimating the cost and constructing the project. The CoST pilot revealed many instances of failure to complete the design before the start of construction as well as instances of poor quality design. For example, in several instances the design team failed to visit the site. In one case, the team assumed the land was flat when it was actually steeply sloping. Site and soil investigations and environmental impact assessments were also missing on a number of projects (ibid.). The consequence of these failures is that expensive adjustments will be needed at later stages.

### 3.3.2 Consequences of poor or incomplete design

Over-design is one factor that contributes to the high unit costs and low returns of completed projects, as well as opportunities for further corruption during implementation. This is especially the case when over-design occurs in connection with corrupt intent. For example, a consultant's over-design can raise not only his own but also the contractor's profits, which may be shared with the corrupt consultant. The consultant's influence is enhanced further if he or she is also responsible for supervising and/or managing during the construction stage.

As a practical matter, incomplete design (whether due to negligence, mismanagement, or corruption) means that adjustments will be needed after the work has started. Although adjustments may occur due to unexpected events and circumstances, even when a project was adequately designed, starting off without a complete plan opens the door to post-contract negotiation and opportunistic behaviour. Cost overruns are inevitable and are generally accompanied by delayed completion. Figure 4 shows the average time and cost overruns on 129 projects analysed for the CoST baseline study.

**Figure 3.: Average time and cost over-run on 129 projects in the CoST baseline study**




*Source: CoST (2011b)*

Cost and time overruns do not necessarily indicate corruption. But an analysis of expert reports on the 67 projects selected for detailed examination as part of the CoST pilot project revealed a number of "causes for concern" (CoST 2011a). Missing orders for contract variation were a common problem. There were also instances where the increased costs were excessive and did not appear to be justified. Unexplained increases in the cost of contracts with the consultants who had been appointed for project design or construction supervision accounted for five out of ten of the concerns identified in the study.

That many problems in project implementation can be traced back to poor quality or incomplete designs is highlighted in an audit report on road projects by the National Audit Office in Tanzania, as discussed in box B.

**Box B: Consequences of design failures on road projects in Tanzania**

The Tanzanian National Audit Office's (NAO's) investigation of 10 major roads completed between 2004 and 2007 revealed significant time and cost overruns (URT 2010). It also found that a huge part of the increased costs were related to miscalculations of some kind that occurred as early as in the design stage. The NAO concluded that engaged consultants were not well managed and design work was not carried out properly and efficiently, which resulted in re-design and led to inevitable cost overruns. The NAO recommended that the government and the responsible agency (TANROADS) take deliberate steps at the pre-contract stages of project implementation to ensure that designs reflect the reality on the ground and to avoid unnecessary alterations during the implementation stage: "The Ministry of Infrastructure Development and TANROADS need to institute a mechanism to review the designs and estimates of the projects as they are prepared by the consultants before they are implemented" (ibid, xii).

Time overruns, like cost overruns, can seriously impact the ERR of projects. However, time overruns are often not treated with the same degree of concern as increased cost. Contractors in some of the countries involved in the CoST pilot (Ethiopia, Zambia, Tanzania, and Vietnam) appeared to pay little regard to the need to make a formal request for an extension of time, and clients took little, if any, action when projects were seriously behind schedule (CoST 2011a, 9). All the 10 projects investigated by Tanzania's NAO (see box B) had revised completion dates during the construction phase, but the executive agency responsible for procurement (TANROADS) approved all of these requests for time extensions without conducting any independent analysis (URT 2010). They also failed to apply any sanctions for the failure to meet contract deadlines (ibid.).

A possible explanation for the lack of concern over extensions of time may also be that fault for delays often lies on both sides, with slow payment by clients due to poor budgeting often a key factor. This will be addressed in the next section.

## 3.4 Budgeting

Once a government has decided to proceed with a project, estimated project costs must be included in the state budget. Since most construction projects extend over several years, multiyear forecasts of costs are essential and must be linked to annual budgets. Recurrent expenditures for operation and maintenance of the asset must also to be integrated into the long-term budget.

### 3.4.1 Corruption risks at the budgeting stage

Corrupt acts at the budgeting stage include the following:

- Projects included in the budget that have not been properly appraised and probably wouldn't pass appraisal ("jumping the fence").
- Contracts signed for projects for which there is no budget (or for which the budget is inadequate).

The pilot phase of the CoST initiative revealed many instances of projects that were started without a formal appraisal (CoST 2011a). There were also some long time lags between the appraisal and the start of construction, which invalidated the original estimates of the ERR and allowed uneconomic projects to move forward.

Signing contracts for projects for which there was no apparent budget occurred in Tanzania when the roads agency TANROADS signed 22 major road contracts in the year prior to the 2010 election (see section 3.1.1 above). Subsequent analysis suggested that the practice of signing contracts for which funding was not assured (and subsequently over spending on budgets) may in fact be quite common and not restricted to election years.[6] Analysis of annual submissions by TANROADS to the Tanzania Joint Infrastructure Sector Review in each of the fiscal years between 2009 and 2013 revealed significant overspending each year.

Poor or non-existent budgeting for construction contracts is also common in Angola. Søreide (2011) reported that costs are often not estimated prior to the start of planning, or even the start of construction. Evidence of weak financial planning and budgeting can be found in the fact that the Angolan government had to negotiate an extension of US$ 500 million with the Export-Import Bank

[6] The analysis was undertaken for a project investigating corruption in the roads sector in Tanzania, funded by the African Development Bank. At the time of publication, the final report has not yet been released by the Prevention and Combatting of Corruption Bureau (PCCB)

of China (EximBank) to fund "complementary actions" in newly completed projects funded under the first phase of China's credit line (Campos and Vines 2008). The complementary actions included vital services such as water and energy networks, telecommunication lines, and water treatment plants for newly built institutes and schools (ibid.).

Further evidence of the Angolan government commissioning projects for which funds were not assured is seen in the scale of government debt to construction companies that was revealed in 2009. The country's finance ministry estimated this debt to be US$ 9 billion, of which US$ 6.8 billion was audited and certified by Ernst and Young (BMI 2010). Although much of this fiscal crisis was brought about by the government not having in place adequate policies to mitigate the risks of volatility in oil prices, the massive budget overruns on projects have also been attributed to such practices as work being initiated without proper contracts and unbudgeted payments being approved by officials (Hansen-Shino and de Oliveira 2011, 21, citing 2010 Economic Intelligence Unit data).

### 3.4.2 Consequences of poor budgeting

Weak project selection and budgeting processes lead to overloaded capital budgets. Funding is spread across too many projects and usually results in late payment of the sums owed to contractors. Interviews with key public officials in Dar es Salaam in March 2014 revealed that the Tanzanian roads agency delayed payments by up to a year and owed US$ 700 million in back payments to contractors. By October 2014 the sum had been reduced but still stood at US$ 400 million. Delayed payment was also widely reported in the CoST pilot study and could usually be traced to a failure to properly budget for the capital requirements of construction projects. For example, 11 of the 18 projects that were examined in Zambia either had no approved budget or had issues over payment to the contractor. In Guatemala, 11 of 13 projects had similar problems (CoST 2011a).

Late payment by the client weakens the client's authority over the contractor and forces compromises – or resort to "informal practices" as explained in an earlier paper (Wells 2014). It also encourages bribery as contractors compete for the limited funds available. Such a scenario is described in box C.

**Box C: The effects of late payment in Ghana**

In correspondence with the author, Dr. George Ofori, Deputy Chair of the CoST board, explained,

> In Ghana, late payment is beyond "very, very serious" (if that is possible). Yes, it is a major element among the causes of corruption in our industry in Ghana. The scenario is simple; payment certificates pile up on the desk of the last few administrators and politicians in the approval process: moving one project's certificate from one stage to the next becomes the subject of corruption, as the contractor has the incentive and the officer sees the opportunity. The problem is that the "debt mountain" is so huge that it will require a major plan, simply to attempt to tackle it. Under the circumstances, I just do not know how contractors are able to continue to work on any government projects. (Email dated 5 April 2014)

## 3.5 Collusion among the key actors

Table 3 summarises corruption risks at all stages of the project cycle, including those arising at later stages from the failures in earlier stages (as outlined above). The table also lists the main actors involved at each stage.

Finally, table 3 sets forth the key role consultants play at each stage of the process. Often it is the contractors who are assumed to be responsible for corruption in the construction sector. The possibility of corruption by the professional consultants appointed to design, manage, or supervise construction (e.g., architects, planners, engineers, or surveyors) is often overlooked and little attention is paid to the process by which contracts for these services are awarded. This may be because the values of consulting contracts are smaller, commonly around 10% of the value of contracts with contractors. But the value of the consultant's contract is not the only relevant factor, since consultants appointed to design a project, or to supervise its construction, may collude with contractors to facilitate the skimming of funds from the construction contracts and may share in the proceeds of such crimes.

Collusion between supervising engineers and contractors is almost always an essential requirement for corruption during project implementation, since the supervising engineer controls most of the avenues through which corruption takes place. This type of collusion can occur even in the absence of corruption in project preparation. Furthermore, the public officials who are managing project implementation on behalf of the client are also almost certainly fully aware of this collusion, and most probably actively collaborate in it. In fact, Mawenya (2007) argues on the basis of his extensive experience in Tanzania that public officials are very often the main perpetrators. If this is the case, it is reasonable to assume that the active collaboration of the client in corrupt acts during implementation probably started at the project preparation stage. Close collaboration among clients, consultants, and contractors – the three C's identified by Mawenya (2007) – facilitates the systematic embezzlement of funds from projects and links the actions at project preparation to the final project outcomes.[7]

Collusion among clients, consultants, and contractors is in fact believed to be widespread in the construction industry in many parts of the world, including in highly developed countries. Evidence is difficult to obtain, but the work of the Charbonneau Commission in Quebec[8] is throwing a bright light on the corrupt relationships among the actors in public construction. The Commission's findings have not yet been published, but a preliminary report prepared for a roundtable discussion (in which the author participated) revealed complex webs of collusion, as well as highly sophisticated stratagems for the extraction of funds from public construction projects. Politicians, high level public officials, consultants, and contractors are all involved.

Close ties among politicians, public sector clients, and private construction companies are also reported from Indonesia, where contractors are prominent in provincial and district parliaments and in the campaign teams for directly elected district heads and governors (van Klinken and Aspinall 2010). Neo-patrimonial networks linking politics with business are both resilient and adaptable, especially at the local level (ibid.).

[7] While it is sometimes assumed that only the public officials acting on the client's behalf during procurement processes are guilty of corruption, there is also evidence of involvement by politicians and senior level civil servants at different stages of the project preparation and implementation – as demonstrated in the following paragraphs.

[8] This entity is officially called the Commission of Inquiry on the Awarding and Management of Public Contracts in the Construction Industry (see https://www.ceic.gouv.qc.ca/la-commission.html).

Table 3. Corruption risks at various stages in the delivery of a construction project

| Stages | Risks | Main actors |
|---|---|---|
| **Project appraisal** | • Political influence or lobbying by private firms that biases selection to suit political or private interests<br>• Promotion of projects in return for party funds<br>• Political influence to favour large projects and new construction over maintenance<br>• Underestimated costs and overestimated benefits to get projects approved without adequate economic justification | • Government ministers<br>• Senior civil servants<br>• Procurement officers<br>• Private consultants (e.g., planners, designers, engineers, and surveyors) |
| **Project selection, design, and budgeting** | • Costly designs that increase consultants' fees and contractors' profits<br>• Designs that favour a specific contractor<br>• Incomplete designs that leave room for later adjustments (which can be manipulated)<br>• High cost estimates to provide a cushion for the later diversion of funds<br>• Political influence to get projects into the budget without appraisal | • Government Ministers<br>• Senior civil servants<br>• Procurement officers<br>• Private consultants (e.g., planners, designers, engineers, and surveyors) |
| **Tender for works and supervision contracts** | • Bribery to obtain contracts (leaving costs to be recovered at later stages)<br>• Collusion among bidders to allocate contracts and/or raise prices (potentially with assistance from procurement officers)<br>• Interference by procurement officers to favour specific firms or individuals<br>• Going to tender and signing contracts for projects that are not in the budget | • Procurement officers<br>• Private consultants (e.g., supervising engineer)<br>• Contractors |
| **Implementation** | • Collusion between contractor and the supervising engineer (with or without the client's knowledge) that results in the use of lower quality materials and substandard work<br>• Collusion between contractors and the supervising engineer to increase the contract price or adjust the work required in order to make extra profits, cover potential losses, or recover money spent on bribes | • Procurement officers<br>• Private consultants (e.g., supervising engineer)<br>• Contractors and subcontractors |
| **Operation and maintenance, including evaluation and audit** | • Agreement by the supervising engineer to accept poor quality work or work below the specification, leading to rapid deterioration of assets<br>• A lack of allocated funds for maintenance, as new construction takes precedence in the project identification stage for future projects | • Procurement officers<br>• Private consultants (e.g., supervising engineer)<br>• Contractors and subcontractors |

# 4. Conclusion – Improving the governance of public investment in construction

Weak governance at each stage of the preparation of construction projects for public investment can result in a higher risk of corruption and allow poor projects to be approved, opening opportunities for further corrupt acts at later stages of the project cycle. Accordingly, a key to protecting investment in publicly funded construction is to strengthen governance.

Key technical actions at country level would be to:

- assess which features are bypassed in project preparation,
- strengthen the effectiveness at each of the four levels of screening, and
- build capacity for project appraisal, estimating, budgeting, and detailed design.

Capacity building is clearly needed in low-income countries. But failure to observe essential measures in project preparation may also be deliberate. In the words of the World Bank, "Public investment spending should be viewed, ultimately, both as a channel to potentially create productive assets and as a vehicle for distributing rents for political purposes" (2013, 100).

If key features are missing or weak because of corrupt intent on the part of politicians, public officials or their consultant advisers, any move to improve governance will threaten vested interests and is unlikely to succeed. In this context, a country specific political economy analysis may help assess the likely outcome of investing in change in the country concerned and may also help identify entry points, appropriate measures and sequencing for doing so.

It is now widely accepted that the catalyst for improved performance is most likely to come from increased demands for accountability. Political economy analysis can also help to assess where such demands may originate (e.g., the legislature, tax payers, voters, or civil society) and to identify measures that might help to strengthen them. Greater transparency in the decision-making processes is one such measure.

If the analysis in this paper is correct, efforts to improve transparency should focus on the procedures surrounding decision-making during project preparation, with full disclosure of feasibility studies (including all assumptions made in the analysis and all details of costs and benefits). Engaging in rigorous pre-project assessment will help to avoid corruption at the outset of a project, as well as at later stages.

However, where corruption is deeply embedded, breaking the links among participants in the various stages of project delivery may be the only way to tackle the systematic embezzlement of funds from construction projects and clear a path to improving the governance of project preparation.

# Annex: Forms of corruption in the construction industry

The World Bank (2006, Annex B, 3) debars any contractor found to have engaged in the following types of misconduct:

> Corrupt practice: "offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party" (coincides with most definitions of bribery).
>
> Fraudulent practice: "any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation" (commonly called fraud).
>
> Collusive practice: "an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party" (commonly called collusion).
>
> Coercive practice: "impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party" (could be regarded as extortion).
>
> Obstructive practice: "(i) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or (ii) acts intended to materially impede the exercise of the Bank's contractual rights of audit and access to information."

Paterson and Chaudhuri (2007, 162–163) offer the following additional definitions in the context of roads:

> Kickback: "Payment made by a successful bidder to a third party as a result of an arrangement made prior to bidding."
>
> Collusion: "Agreements among bidders to manipulate the bidding process or its results in a manner that is mutually satisfactory."
>
> Bid rigging: "Actions that influence a bid price in a non-competitive way to achieve a prearranged objective."
>
> State capture: "Manipulation of national budget allocation."

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construction

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Corruption in the construction of public infrastructure has particularly serious implications for developing countries. Inappropriate project choice, high prices, poor quality, excessive time and cost overruns, inadequate maintenance, and low returns, among other challenges, impact negatively on economic growth and poverty alleviation. Corruption during the early stages of the project cycle, when projects are appraised, designed, and budgeted, may open up doors for additional corruption later on. Examples are presented to demonstrate how skewed incentives during project preparation can facilitate corruption during implementation (and create further negative impacts on project value). Efforts to improve transparency should focus on the procedures surrounding decision-making during project preparation. However, where corruption is deeply embedded, breaking the links among participants in the various stages of project delivery may be the only way to improving the governance of project preparation.

U4 Anti-Corruption Resource Centre
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